

What is claimed is:

1. A method for processing an audio signal having one or more directional input channels, comprising:
 - 5 detecting the number and directional designators of said directional input channels; and
 - processing each of said directional input channels by one of a plurality of selectable processes, the selectable process applied to each directional input channel being responsive to said detecting step according to a predetermined pattern without
 - 10 user intervention.
- 2 A method for processing an audio signal in accordance with claim 1, wherein said selectable processes include a process which includes combining said directional input channel with an other directional input channel.
3. A method for processing an audio signal in accordance with claim 2,
 - 15 wherein said process includes attenuating said other directional input channel.
4. A method for processing an audio signal in accordance with claim 2, wherein said selectable processes include a process which includes phase shifting said other directional input channel.
5. A method for processing an audio signal in accordance with claim 1,
 - 20 wherein said predetermined pattern includes, responsive to said detecting step detecting a monophonic surround channel, a left channel signal, and a right channel signal, a selectable process that includes processing said left channel signal to produce a modified left channel signal and processing said right channel signal to produce a modified right channel signal.

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6. A method for processing an audio signal in accordance with claim 5, wherein said modified left channel signal and said modified right channel signal include a surround channel component, and where said left channel surround channel component and said right channel surround channel component are out of phase.
- 5 7. A method for processing an audio signal in accordance with claim 1, wherein said processing produces a number of output directional channels, said number of output directional channels and the directional designators of said output directional channels being responsive to said detecting step according to a predetermined pattern
8. A method for processing an audio signal having one or more directional
10 input channels, comprising:
 detecting the number and directional designators of said directional input channels; and
 processing said directional input channels to produce an alternatively selectable number of output directional channels, said alternatively selectable number of output
15 directional channels and the contents of said output directional channels being responsive to said detecting step according to a predetermined pattern without user intervention.
9. A method for processing an audio signal in accordance with claim 8, wherein said alternatively selectable numbers includes only numbers equal and greater
20 than said number of directional input channels.
10. Method for processing an audio signal in accordance with claim 8 wherein said number of input channels is a number from one to five, inclusive, and where said alternatively selectable number includes four and five.

11. A method for processing an audio signal, comprising:
determining whether said audio signal is an analog signal or a digital signal;
responsive to a determining that said signal is an analog signal, decoding said
signal to produce a left channel, a right channel, a center channel, a left surround
5 channel and a right surround channel;

responsive to a determining that said audio signal is a digital signal, detecting
the number and directional designators of directional input channels in said audio
signal; and

processing each of said directional input channels by one of a plurality of
10 selectable processes, the selectable process applied to each directional input channel
being responsive to said detecting step according to a predetermined pattern without
user intervention.

12 A method for processing an audio signal in accordance with claim 11,
wherein said selectable processes include a process which includes combining said
15 directional input channel with an other directional input channel.

13. A method for processing an audio signal in accordance with claim 12,
wherein said process includes attenuating said other directional input channel.

14. A method for processing an audio signal in accordance with claim 11,
wherein said selectable processes include a process which includes phase shifting and
20 combining with an other directional input channel.

15. A method for processing an audio signal in accordance with claim 11,
wherein said predetermined pattern includes, responsive to said detecting step detecting
a monophonic surround channel, a left channel signal, and a right channel signal, a
selectable process that includes processing said left channel signal to produce a
25 modified left channel signal and processing said right channel signal to produce a
modified right channel signal.

16. A method for processing an audio signal in accordance with claim 15, wherein said modified left channel signal and said modified right channel signal include a surround channel component, and where said left channel surround channel component and said right channel surround channel component are out of phase.

5 17. A method for processing an audio signal in accordance with claim 11, wherein said processing produces a number of output directional channels, said number of output directional channels and the directional designators of said output directional channels being responsive to said detecting step according to a predetermined pattern

18. A method for processing an audio signal, comprising:
10 determining whether said audio signal is an analog signal or a digital signal; responsive to a determining that said signal is an analog signal, decoding said signal to produce a left channel, a right channel, a center channel, a left surround channel and a right surround channel;
responsive to a determining that said audio signal is a digital signal, detecting
15 the number and directional designators of directional input channels in said audio signal; and
processing said directional input channels to produce a plurality of output directional channels, the number of output directional channels and the directional designators of said output directional channels being responsive to said detecting step
20 according to a predetermined pattern without user intervention.

19 A method for processing an audio signal in accordance with claim 18, wherein said selectable processes include a process which includes combining said directional input channel with an other directional input channel.

20. A method for processing an audio signal in accordance with claim 19,
25 wherein said process includes attenuating said other directional input channel.

21 A method for processing an audio signal in accordance with claim 18, wherein said selectable processes include a process which includes phase shifting and combining with an other directional input channel.

22. A method for processing an audio signal in accordance with claim 18,
wherein said predetermined pattern includes, responsive to said detecting step detecting
a monophonic surround channel, a left channel signal, and a right channel signal, a
selectable process that includes processing said left channel signal to produce a
5 modified left channel signal and processing said right channel signal to produce a
modified right channel signal.

23. A method for processing an audio signal in accordance with claim 22,
wherein said modified left channel signal and said modified right channel signal
include a surround channel component, and where said left channel surround channel
10 component and said right channel surround channel component are out of phase.

24. A method for processing an audio signal in accordance with claim 18,
wherein said processing produces a number of output directional channels, said number
of output directional channels and the directional designators of said output directional
channels being responsive to said detecting step according to a predetermined pattern

15 25. A method for processing an audio signal having one or more directional
input channels, comprising:
detecting the number of surround channels in said audio signal; and
processing said directional input channels by one of a plurality of selectable
processes to produce two stereo surround directional channels, the selectable process
20 applied to said directional input channels being responsive to said detecting step
according to a predetermined pattern without user intervention.

26. A method for processing an audio signal in accordance with claim 25,
wherein said number of surround channels is zero.

27. A method for processing an audio signal, comprising:
25 determining whether said audio signal has been equalized for a large room; and
responsive to a determining that said audio signal has been equalized for a
large room, applying a pre-selected gain below a threshold frequency.

33. A method for processing an audio signal in accordance with claim 27, responsive to a determining that it is not known whether said audio signal has been equalized for a large room, determining whether said audio signal is surround encoded, and

- 5 responsive to a determining that audio signal is surround encoded, applying said pre-selected gain below said threshold frequency, and
 responsive to a determining that said audio signal is not surround encoded, not applying said pre-selected gain below said threshold frequency.

34. An apparatus for processing an audio signal having one or more directional
10 input channels, comprising:

- a input characteristics determiner for detecting the number and directional designators of said directional input channels; and
 a processor for processing each of said directional input channels, said processor being designed and constructed to process said audio signal by one of a
15 plurality of selectable processes, the selectable process applied to each directional input channel being responsive to said input characteristics determiner according to a predetermined pattern without user intervention.

35. An apparatus for processing an audio signal in accordance with claim 34, wherein said processor is designed and constructed to produce a number of output
20 directional channels, said number of output directional channels and the directional designators of said output directional channels being responsive to said input characteristics determiner according to a predetermined pattern

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36. An apparatus for processing an audio signal having one or more directional input channels, comprising:

an input characteristics determiner for detecting the number and directional designators of said directional input channels; and

5 a processor for processing said directional input channels, said processor being designed and constructed to produce an alternatively selectable number of output directional channels, the number of output directional channels and the contents of said output directional channels being responsive to said input characteristics determiner according to a predetermined pattern without user intervention.

10 37. An apparatus for processing an audio signal, comprising:

an input characteristics determiner for determining whether said audio signal is an analog signal or a digital signal and for determining the number and directional designators of digital signals;

15 a first processor, responsive to said input characteristics determiner for decoding said analog signals to produce a left channel, a right channel, a center channel, a left surround channel and a right surround channel; and

20 a second processor, responsive to said input characteristics determiner, for processing each of said directional input channels of said digital signals by one of a plurality of selectable processes, the selectable process applied to each directional input channel being responsive to said input characteristics determiner according to a predetermined pattern without user intervention.

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38. An apparatus for processing an audio signal in accordance with claim 37,
wherein said processor is designed and constructed to produce an alternatively
selectable number of output directional channels, said number of output directional
channels and the directional designators of said output directional channels being
5 responsive to said detecting step according to a predetermined pattern

39. An apparatus for processing an audio signal, comprising:
input characteristics determiner for determining whether said audio signal is an
analog signal or a digital signal and for determining the number and directional
designators of channels in said digital signals;
10 a decoder, responsive to said input characteristics determiner for decoding
said analog signals to produce a left channel, a right channel, a center channel, a left
surround channel and a right surround channel; and
a processor, for processing said directional input channels in said digital signals
to produce a plurality of output directional channels, the number of output directional
15 channels and the directional designators of said output directional channels being
responsive to said input characteristics determiner according to a predetermined pattern
without user intervention.

40. An apparatus for processing an audio signal in accordance with claim 39,
wherein said processor being constructed and arranged to produce a alternatively
20 selectable number of output directional channels, said alternatively selectable number
of output directional channels and the directional designators of said output directional
channels being responsive to said detecting step according to a predetermined pattern

41. An apparatus for processing an audio signal, comprising:
an input characteristics determiner for determining whether said audio signal
25 has been equalized for a large room;
an equalizer, responsive to said determiner, for applying a pre-selected gain
below a threshold frequency.

42. An apparatus for processing an audio signal in accordance with claim 41,
wherein said threshold frequency is approximately 120 Hz

43. An apparatus for processing an audio signal in accordance with claim 41,
wherein said pre-selected gain is approximately 10dB.

5 44. An apparatus for processing an audio signal in accordance with claim 41,
wherein said input characteristics determiner is constructed and arranged to determine
if said audio signal includes a low frequency equalization channel

45. An apparatus for processing an audio signal in accordance with claim 41,
wherein said input characteristics determiner is further constructed and arranged to
10 determine whether said audio signal is surround encoded.

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